

What is claimed is:

1. An electromagnetic actuator comprising:

a fixed core supported by a bottom wall of a housing made of magnetic material;

a movable core arranged opposite to the fixed core via an air gap to drive a movable member; and

a coil assembly comprising a bobbin supported by the housing to surround the fixed and movable cores, and a coil wound around the bobbin,

wherein the movable member and the movable core are coupled by coupling means for adjusting the air gap between the fixed core and the movable core, and

wherein an adjustment operating hole through which the coupling means is adjusted is provided on the fixed core so as to be opened outside the bottom wall of the housing.

2. The electromagnetic actuator according to claim 1, wherein the fixed core is integrally formed with a positioning shaft in which the adjustment operating hole is opened on an outer end surface and with a flange-shaped first yoke which protrudes from the outer periphery of the fixed core to be arranged opposite to one end surface of the coil assembly; the positioning shaft is fitted and fixed into a positioning hole provided at the bottom wall of the housing; the first yoke is brought into close contact with an inner surface of the bottom wall to surround the movable core; and a second yoke arranged opposite to the other end surface of the coil assembly is continuously provided to the housing.

3. The electromagnetic actuator according to claim 2, wherein the bobbin is continuously provided with a coil cover which covers the outer periphery of the coil to seal the coil to the bobbin; the housing is arranged so that its bottom wall faces downward; and between the first yoke and the other end surfaces of the bobbin and the coil cover, there is interposed an elastic plate which watertightly comes into close contact with their opposite surfaces.

4. The electromagnetic actuator according to claim 1, wherein the fixed core is integrally formed with a flange-shaped first yoke which protrudes from an outer periphery of the fixed core to be arranged opposite to one end surface of the coil assembly and which is supported on the bottom wall of the housing; a second yoke which surrounds the movable core and is arranged opposite to the other end surface of the coil assembly is fixed to the housing; a tube-shaped bearing member which slidably supports the movable core is slidably fitted in the second yoke; and a set spring is provided in a compressed state between the second yoke and an outward flange which is formed at a lower end of the bearing member and which is supported on the first yoke, thereby biasing the outward flange toward the first yoke.

5. An electromagnetic actuator comprising:

a fixed core supported by a bottom wall of a housing made of magnetic material;

a movable core arranged opposite to the fixed core via an air gap to drive the movable member;

a coil assembly comprising a bobbin supported by the housing to surround the fixed and movable cores, and a coil wound around the bobbin; and

a tube-shaped bearing member disposed inside the coil assembly to slidably support the movable core,

wherein a first yoke for holding the coil assembly in corporation with the bottom wall is continuously provided to the housing;

wherein the bearing member is slidably fitted in the first yoke;

wherein a supporting portion for supporting an outward flange formed at one end of the bearing member is provided on the bottom wall; and

wherein a set spring for biasing the outward flange toward the supporting portion is provided in a compressed state between the outward flange and the first yoke.

6. The electromagnetic actuator according to claim 5, wherein the fixed core is integrally formed with a positioning shaft fitted and fixed in a positioning hole provided on the bottom wall and with a second yoke which comes into close contact with an inner surface of the bottom wall and opposes to the first yoke with the coil assembly sandwiched therebetween, and the second yoke constitutes the supporting portion.

7. An electromagnetic actuator comprising:

a fixed core supported by a bottom wall of a housing made of magnetic material;

a movable core arranged opposite to the fixed core via an air gap to drive a movable member; and

a coil assembly comprising a bobbin supported by the housing to surround the fixed and movable cores, and a coil wound around the bobbin,

wherein a small strut for insert-connecting a proximal end of a coupler terminal is integrally formed on one end surface of the bobbin;

wherein an outgoing line of the coil wound around the small strut is connected to the coupler terminal; and

wherein on a coil cover molded on an outer periphery of the coil and the bobbin so as to seal the coil to the bobbin, there are integrally formed a coupler for holding the coupler terminal to protrude outward in a radial direction of the coil assembly and a protruded portion for enveloping the small strut to protrude from an end surface of the coil cover.

8. The electromagnetic actuator according to claim 7, wherein the coupler is exposed to the outside through an aperture provided from the peripheral wall of the housing to the bottom wall, and the protruded portion is arranged within the aperture so as to be adjacent to the bottom wall.